

TRIM OF A CEILING SYSTEM AND METHOD OF ASSEMBLING THE SAME

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit under 35 U.S.C. §119(e) of U.S. provisional application Serial No. 60/491,057, filed July 30, 2003.

BACKGROUND

[0002] The invention relates generally to suspended ceiling systems, and more particularly to a connector clip and a method of assembling the trim of a suspended ceiling system using the connector clip of the invention.

[0003] Suspended ceiling systems are common in the building industry. Certain suspended ceiling designs require a floating edge ceiling, or island ceiling, where one or more edges of the ceiling system do not extend all the way to the wall of a structure, and, therefore, are exposed. These floating edge ceilings are in increasing demand as such systems provide an architect with substantially unlimited aesthetic variations in a ceiling system.

[0004] These floating edge ceiling systems typically include trim elements which provide a finished edge to the suspended ceiling system and support for border panels. Where the length of the ceiling edge is longer than the individual length of a trim element, a number of trim elements may be butt-spliced together to create one continuous trim beam. As at least one of the trim elements is visible in a floating ceiling system, it is desirable for the butt joint between adjacent trim elements to be as inconspicuous as possible so as to provide the clean appearance of a single trim element. Imperfections, including misalignment of the trim elements and gaps between the trim elements, create a nonuniform appearance in the ceiling trim and take away

from the aesthetic appeal of the floating ceiling. Connector clips have traditionally been used to interconnect trim elements. However, the problem with conventional connector clips is that when the connector clip is attached to a trim element, the position of the trim element is fixed, and as a result, any gaps appearing between adjacent trim elements, or any misalignment of the trim elements, cannot easily be corrected.

[0005] Conventional techniques used to correct such imperfections, including hand realignment and filling and painting, are tedious and time consuming. Thus, it is desirable to provide a connector clip that eliminates these imperfections and creates a trim having a uniform appearance in a quick, easy and cost efficient manner.

SUMMARY

[0006] The present invention provides a ceiling trim having a plurality of trim elements and a plurality of connector clips for interconnecting the plurality of trim elements to one another. Each trim element has a longitudinally extending web and a pair of flanges which cooperate with the web to form a connector clip receiving channel. Each connector clip is formed of a single elongated plate and includes a first end section, a second end section, an intermediate section which integrally connects the first and second end sections and a means for securing the end sections to the trim elements. The intermediate section includes a means for cinching together the edges of adjacent trim elements so as to provide a ceiling edge having an appearance free of imperfections.

[0007] The method of assembling the trim of a suspended ceiling system includes providing a plurality of trim elements, each trim element having a connector clip receiving channel; providing a plurality of connector clips in accordance with the invention; slidably engaging a

first end section of the connector clip in the connector clip receiving channel of a first trim element; aligning the end of the first trim element with the first end section of the connector clip such that when a fastener is inserted into a fastener receiving aperture extending through the first end section, the fastener contacts the first trim element; inserting a fastener into a fastener receiving aperture extending through the first end section and tightening the fastener; slidably engaging a second end section of the connector clip in a connector clip receiving channel of a second trim element; aligning the end of the second trim element with the first end section of the connector clip such that when a fastener is inserted into a fastener receiving aperture extending through the second end section, the fastener contacts the second trim element; and horizontally adjusting the position of the first and second trim elements by inserting a third fastener into mutually aligned fastener receiving apertures in the intermediate section and tightening the third fastener until the trim elements are abutting.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 illustrates a perspective view of a connector clip in accordance with an exemplary embodiment of the invention.

[0009] FIG. 2 illustrates a perspective view of the connector clip of FIG. 1 showing the connector clip attached to adjacent trim elements.

[0010] FIG. 3 illustrates a perspective view of a connector clip in accordance with a second exemplary embodiment of the invention.

[0011] FIG. 4 illustrates a top plan view of the clip of FIG. 3.

[0012] FIG. 5 illustrates a side view of the clip of FIG. 3.

[0013] FIG. 6 illustrates a side view of the clip of FIG. 3.

[0014] FIG. 7 illustrates a perspective view of the connector clip of FIG. 3 showing the connector clip attached to adjacent trim elements.

[0015] FIG. 8A is an exploded view of FIG. 7.

[0016] FIG. 8B is a partially exploded view of FIG. 7.

[0017] FIG. 9 illustrates a perspective view of a connector clip in accordance with a third exemplary embodiment of the invention.

DETAILED DESCRIPTION OF THE DRAWINGS

[0018] The following description of the invention is provided as an enabling teaching of the invention in its best, currently known embodiment. Those skilled in the art will appreciate that many modifications to the exemplary embodiments of the present invention are possible without departing from the spirit and scope of the present invention. It will also be apparent that some of the desired benefits of the present invention can be obtained by selecting some of the features of the present invention without utilizing other features. Accordingly, those who work in the art will recognize that many modifications and adaptations to the present invention are possible and may even be desirable in certain circumstances and are a part of the present invention. Thus, the following description is provided as illustrative of the principles of the present invention and not in limitation thereof, since the scope of the present invention is defined by the claims.

[0019] FIG. 1 illustrates an example embodiment of a connector clip for interconnecting adjacent trim elements. The connector clip 10 is made from a single piece of strong, resilient material, such as steel or aluminum, and includes first and second end sections, 12 and 14 respectively, and an intermediate section 16 integrally connecting the first and second end elements 12, 14. Each of the first and second end sections 12, 14 have a longitudinally extending

substantially planar web, 18 and 20 respectively. As shown in FIG. 2, webs 18 and 20 lie in a common plane so that they can be received in a continuous clip receiving channel formed by two adjacent and aligned trim elements 13, 15.

[0020] In a second example embodiment, as shown in FIGS. 3-7, the first end section 12' has a longitudinally extending substantially planar web 18 and a pair of attachment flanges 28, 30. As shown in FIG. 5, attachment flange 28 extends from a top edge portion 31 of web 18 and attachment flange 30 extends from a bottom edge portion 33 of web 18. Similarly, the second end section 14' has a longitudinally extending substantially planar web 20 and a pair of attachment flanges 32, 34. As shown in FIG. 6, attachment flange 32 extends from a top edge portion 35 of web 20 and attachment flange 34 extends from a bottom edge portion 37 of web 20. The attachment flanges, 28, 30, 32 and 34, are bent in order to provide a clearance for fastener and to provide the connector clip 10 with added strength. Each attachment flange, 28, 30, 32 and 34, has a substantially vertical surface member 40 and a substantially horizontal surface member 42. Each substantially horizontal surface member 42 integrally connects a substantially vertical surface member 40 to an edge portion 35, 37 of the web. In this configuration, the substantially vertical surface members 40 are capable of being inserted in the connector clip receiving channels of trim elements 13 and 15.

[0021] In both the first and second example embodiments, each end section 12, 12', 14 and 14' further includes a means for fixedly securing the end section to a trim element. As best shown in FIGS. 3 and 4, the means for securing the first and second end sections 12, 14 are fastener receiving apertures, 22 and 24 respectively, which extend through webs 18, 20 of the first and second end sections. As shown in FIGS. 1 and 2, a fastener 26, such as a screw-type fastener, is insertable in each of the aligned apertures. The fastener 26 is long enough to extend through the

fastener receiving apertures, 22 and 24, and contact the surface of the trim elements. When tightened, the fasteners 26 fixedly secure the connector clip 10 to the trim elements 13, 15 and thereby prevent longitudinal movement of the connector clip 10 in the trim elements 13, 15. In one example configuration, the fastener 26 is press-fit against the surface of trim elements 13, 15. In an alternative configuration, the fastener 26 can extend through a fastener receiving aperture 22, 24 and further through a fastener receiving aperture (not shown) formed in a trim element.

[0022] The intermediate section 16, which interconnects the first and second end sections has first and second integrally connected leg portions 50, 52. The first and second legs portions 50, 52 or can be interconnected by an intermediate portion 54, as shown in FIG. 3, or can be directly connected at an apex, as shown in FIG. 9. The lower edge 17 of intermediate section 16 can be formed to a bevel angle to provide a mitered recess which allows ceiling panels of varying thicknesses to fit under the angulated intermediate section 16 without interference.

[0023] As shown in FIGS. 3, 5, 6 and 9, the first leg portion 50 includes a fastener receiving aperture 56 and the second leg 52 includes a fastener receiving aperture 58. The fastening receiver aperture 56 of the first leg portion 50 is in mutual alignment with the fastening receiver aperture 58 of the second leg portion 52. As shown in FIGS. 1, 2 and 7, a fastener 60, such as a mechanical fastener, can be inserted through the mutually aligned apertures 56, 58. When the end sections 12, 14 are fixedly attached to adjacent trim elements 13, 15, as described above, tightening or loosening of fastener 60 will adjust the position of the trim elements 13, 15. By way of example, when a gap exists at the butt joint 11 between the first and second trim elements 13, 15, the fastener 60 can be tightened to pinch together the leg portions 50, 52 of the

intermediate section 16. This, in turn, pulls the trim elements 13, 15 together until they are abutting one another.

[0024] Although the webs 18, 20 of the first and second end sections 12, 14 may be of equal length, it is preferred that one end section be longer than the other end section so that the web of the longer section spans the butt joint 11 between adjacent trim elements 13, 15. As shown in FIG. 4, the web 18 of the first end section 12' is longer than the web 20 of the second end section 14'. If the intermediate section 16 spanned the butt joint 11, the butt joint would remain somewhat flexible as the intermediate section 16 is not capable of a contiguous relationship with the butt joint 11. Flexibility at the butt joint 11 may lead to misalignment of mating trim elements and/or gaps between mating trim elements. Thus, contiguous support at the butt joint 11, as provided by the longer end section 12', eliminates the potential for these imperfections. Additionally, the longer end section 12' of the connector clip 10 may include alignment indicia 62 on the web to assist in aligning the connector clip in the continuous connector receiving channel provided by two adjacent trim elements. The indicia 62 is located between aperture 22 of the longer end section 12' and leg portion 50 of the intermediate section 16.

[0025] As shown in FIGS. 2, 7 and 8, each trim element 13, 15 includes a longitudinally extending vertical web 47 formed with a pair of integral, spaced apart flanges 49 projecting inwardly from the same side of the vertical web 47. The flanges 49 cooperate with the vertical web 47 to form a channel 51 for slidably receiving the connector clip 10.

[0026] The invention further includes a method of assembling the ceiling trim. The method includes providing a plurality of connector clips 10 of the invention and a plurality of trim elements 13, 15. FIG. 8A shows a connector clip 10 and adjacent trim elements 13, 15 prior to assembly. To assemble the ceiling trim, the connector clip 10 is slid into the connector clip

receiving channel 51 of trim element 15. As shown in FIG. 8B, the end of trim element 15 is aligned with the longer end section 12' such that when a fastener 26 is inserted into a fastener receiving aperture 24, shown in FIG. 3, of the shorter end section 14', the fastener contacts the surface of vertical web 47 of trim element 15. A fastener 26 is then inserted into the fastener receiving aperture 24 and is tightened so as to prevent further longitudinal sliding of the connector clip 10 in the connector clip receiving channel 51 of trim element 15.

[0027] The longer end section 12' of the connector clip 10 is then slid into the connector clip receiving channel 53 of an adjacent trim element 13. The end of trim element 13 is also aligned with the first end section 12' of the connector clip 10 such that when a fastener 26 is inserted into the fastener receiving aperture 22, shown in FIG. 3, of the shorter end section 14', the fastener 26 contacts the surface of vertical web 49 of trim element 13. A fastener 26 is inserted into the fastener receiving aperture 22 and is tightened so as to prevent further longitudinal sliding of trim element 13 along the end section 12' of the connector clip 10. A third fastener 60 is inserted into the mutually aligned fastener receiving apertures 56, 58, shown in FIG. 3, in the intermediate section 16 and is tightened until trim elements 13 and 15 are abutting as shown in FIGS. 1 and 7.